TENEN ENVIRONMENTAL

MEMORANDUM

To: Rye City Council

From: Matthew Carroll, P.E. / Tenen Environmental

Date: August 4, 2014

Subject: Theodore Fremd Senior Housing Zoning District Change
150 North Street – Rye, New York
Review of Environmental Conditions

The City of Rye has retained Tenen Environmental to review the environmental information pertaining to contamination on the above property (the Site) to support the Rye City Council in their determination of whether the environmental impacts identified at the Site are a significant adverse impact and, specifically, whether the proposed action may have an impact on human health concerns associated with exposure to new or existing sources of contaminants. This memorandum briefly describes the proposed action and environmental setting, summarizes the Site's regulatory history and findings of prior environmental investigations, and provides recommendations for further actions.

Summary of Proposed Development and Site Setting

The Site is a 2.08-acre lot fronting North Street and Theodore Fremd Avenue in the City of Rye, Westchester County, New York. The proposed future use of the property is senior affordable housing, which requires a change in zoning designation to RA-5, *Senior Citizens Apartment*.

The Site has been largely vacant since at least 1925, with the exception of a small shed. A Phase I environmental site assessment (ESA) did not identify previous uses at the Site that would likely use petroleum or hazardous materials. The Site is located downgradient of two adjoining, gasoline service stations (Valero Service Station located at 300 Theodore Fremd Avenue and Banahan Brothers Service Station located at 310 Theodore Fremd Avenue).

Surficial geology of the project Site is mapped as glacial till consisting of poorly sorted sands. The Site is located over an unconfined aquifer consisting of sand and gravel oriented in a north-south direction. Bedrock was encountered at depths ranging from six to fifteen feet below grade (ft-bg), with the shallowest depths in the northern portion of the property. Groundwater flow is to the north-northeast. The depth to groundwater is approximately one to three feet below grade (ft-bg). Several wells on the property have existed since the initial 1992 investigation and have been routinely used as groundwater gauging and sample collection points.

Documents Reviewed

In the course of this review, the following sources were accessed:

- City of Rye, Theodore Fremd Senior Affordable Housing Zoning Change documentation, http://www.egovlink.com/rye/docs/menu/home.asp, http://www.ryeny.gov/TFseniorhousingZDC.cfm
- NYSDEC, Spill case file, 150 North Street, FOIL 14-1956.

- NYSDEC, Spill report and remedial documents, 300 Theodore Fremd Avenue, FOIL 14-0480.
- NYSDEC Spill report and remedial documents, 310 Theodore Fremd Avenue, FOIL 14-0479.
- Westchester County Department of Health, FOIL 14-348.
- Documents provided by John Shoemaker, Rye citizen. http://www.egovlink.com/public_documents300/rye/published_documents/Theodore%20Fremd%20Senior%20Housing%20Zoning%20District%20Change/Documents%20obtained%20through%20FOIL.pdf

Prior Environmental Investigation and Remediation at the Site

In 1992, a Phase I environmental study and subsurface investigation was completed at the property. The investigation included the advancement of soil borings to evaluate soil conditions and depth to bedrock. Groundwater monitoring wells were also installed. Results of the soil and groundwater analyses revealed elevated concentrations of petroleum-related compounds in both the soil and groundwater. The petroleum constituents above relevant standards were the compounds benzene, toluene, ethylbenzene and xylenes.

In 1993, an additional subsurface investigation was completed and included surface soil sampling, advancement of soil borings and the installation of groundwater monitoring wells. Results of the surface and subsurface soil analyses did not detect petroleum compounds, however, elevated concentrations of petroleum-related compounds were observed in the groundwater, with the highest recorded levels identified within the western portion of the property.

In 1994, a Site assessment conducted by the New York State Department of Environmental Conservation (NYSDEC) confirmed that the groundwater within the western portion of the property was impacted by petroleum-related compounds. NYSDEC subsequently contracted remediation contractors to further assess the conditions of the soil and groundwater and to employ remedial technologies for site closure.

Remediation, consisting of a high vacuum extraction (HVE) system, commenced in August 1996. The HVE system collected groundwater for on-site treatment and was operated for several years until it was no longer effective (i.e., no further decrease in the remaining residual concentrations). By February 2009, the groundwater concentrations were below relevant guidance levels in the sampled monitoring wells. Spill number 93-03102 for the Site was closed by the NYSDEC on August 19, 2009.

Current Site Conditions

Following closure of Spill number 93-03102, additional soil and groundwater samples have been collected. Soil concentrations were compared to the NYSDEC unrestricted use and restricted-residential use soil cleanup objectives (SCOs). Groundwater concentrations were compared to the NYSDEC Class GA standards, which are based on the best usage of the groundwater as drinking water. At the Site, drinking water will be provided by a regulated utility, United Water. Several other uses are considered by NYSDEC, although guidance and standards are not promulgated for every compound. The concentrations were also compared with levels for fish propagation, fish survival, wildlife protection and aesthetic considerations for fresh water; these are considered due to the presence of potential surface water bodies (i.e., wetlands and stream) at the Site.

Groundwater sampling was completed in 2010, 2013 and 2014 and showed that dissolved concentrations of petroleum constituents were again present above the Class GA standards, albeit at concentrations lower than the pre-remediation concentrations.

The most recent groundwater samples were collected in 2014 from two monitoring wells, designated NE and NW. Only one compound, benzene, was detected above the Class GA standards. The concentration was 27.2 micrograms per liter (ug/L) in well NE, above the standard of 1 ug/L, but significantly lower than 1,660 ug/L, the concentration of benzene detected in the 2013 sampling. The 27.2 ug/L concentration is below the standards for fish propagation, fish survival, wildlife protection and aesthetic considerations for fresh water. Note that the comparisons to fish propagation, fish survival and wildlife protection are conservative in nature as a potential stream is present but is not protected or classified by NYSDEC and is, therefore, not considered to be an important natural habitat.

In addition to the aforementioned benzene level, the 2013 sampling also identified other petroleum-related compounds above relevant standards. These concentrations are attributable to the off-site, hydraulically upgradient properties where remedial activities were completed.

One well in the southwest portion of the Site was sampled in 2013, but not 2014. Concentrations of three petroleum-related compounds were detected above the Class GA standards. Two compounds were detected slightly above the guidance for fish propagation. As noted above, this is a conservative comparison as the Site is not considered to be an important natural habitat. It is likely that the concentrations in this well will have decreased, similar to well NE; however, it is assumed that similar levels are present for the purposes of this analysis.

Soil sampling at the Site was conducted in April 2014 on behalf of the Applicant and in coordination with the Westchester County Department of Health (WCDOH). A comparison of the results to the current NYS Part 375 unrestricted use and restricted-residential use soil cleanup objectives (SCOs) indicates that acetone, arsenic, chromium, chrysene and lead were detected above the unrestricted use SCOs. Both arsenic and lead were also detected above the restricted-residential use SCOs, the appropriate comparison given the proposed Site use. Arsenic was detected at a concentration of 19.9 milligram/kilogram (mg/kg), slightly above the restricted-residential use SCO of 16 mg/kg and lead was detected at a concentration of 613 mg/kg, above the restricted-residential use SCO of 400 mg/kg.

Current Site Regulatory Status

NYSDEC has closed spill record #93-03102, which was associated with the Site. NYSDEC is aware of the proposed future use, the concentrations of residual contamination that remain at the Site and the status of the remedial efforts at the adjoining properties. NYSDEC has not imposed any requirements for engineering or institutional controls. However, in a May 7, 2014, letter report, the Westchester County Health Department (WCDOH) detailed, and indicated that NYSDEC agreed with, the following design-specific elements to address potential impacts:

- Open parking on the first floor.
- Sub-slab depressurization system (SSDS) or impervious liner beneath the enclosed spaces for the elevator. Potential waterproofing of elevator pits.
- Three feet of fill material to act as a cap.

No other regulatory requirements or guidance has been identified for the Site. Both NYSDEC and WCDOH have reviewed the environmental data in the context of the proposed future use.

Status of Upgradient Spill Sites

The Site is located downgradient of two gasoline service stations.

The Valero Service Station is located at 300 Theodore Fremd Avenue and is associated with NYSDEC Spill numbers 0402976, 0711483, 1101225 and 1309734. Currently, all Spill records have been closed by NYSDEC. Spill numbers 0711483 and 1309734 were closed on July 1, 2014.

The Banahan Brothers Service Station is located at 310 Theodore Fremd Avenue and is associated with NYSDEC Spill number 8900699. The Spill record has been closed by NYSDEC.

Reportedly, elevated levels of gasoline constituents remain in the weathered bedrock at the Banahan Brothers property and in the soil along the border of the Site adjacent to the Valero property. This indicates that low levels of petroleum constituents are likely to remain in the groundwater at the Site, at least in the near future, given that there are no known plans for additional remediation at either of the adjoining properties. Please note that a soil sample collected on-Site in the area of the Valero property did not show elevated concentrations of petroleum-related compounds.

Conclusions and Recommendations

Existing Contamination
The historical groundwater data shows that concentrations of petroleum-related compounds at the Site have decreased following remedial activities completed at the Site and two upgradient gasoline stations, with occasional concentration spikes. The sources of the contamination (leaking underground storage tanks) have been removed from both upgradient locations. Based on the most recent sampling, conducted on March 25, 2014, residual petroleum-related constituents remain in the groundwater at concentrations above the NYSDEC Class GA Standards, which are appropriate levels for drinking water. While this is the NYSDEC goal for all groundwater quality, drinking water will be provided by a regulated utility (United Water).

The existing information indicates that the petroleum constituents have migrated to the Site from the adjoining upgradient gasoline service stations (Valero Service Station located at 300 Theodore Fremd Avenue and Banahan Brothers Service Station located at 310 Theodore Fremd Avenue) through dispersion and transport through groundwater. Remediation has been completed at the Site and both adjoining properties with oversight by NYSDEC. The remedial activities have resulted in decreased concentrations of petroleum in soil and groundwater and all Spill records have been closed; however, residual impacts remain. In order to close a Spill, NYSDEC must make a determination that the implemented remedy will "ensure adequate protection of human health and the environment", as well as to "mitigate environmental damage" to the extent these have occurred (NYSDEC Technical Field Guidance, *Closing-Out a Spill*).

Soil sampling has shown several compounds above the NYSDEC unrestricted use SCOs, including two compounds, arsenic and lead, which are also above the restricted-residential use SCOs, the appropriate comparison given the proposed Site use as a multi-family residential development.

Development of properties with environmental impacts (i.e., residual contamination) for residential use is common practice in New York State and can be consistent with the SEQRA goal of limiting impacts to human health from exposure to new or existing sources of contamination. The requirements for such development include characterization of existing contamination and identification of potential impacts to human health. The characterization of the Site is consistent with typical investigations of petroleum releases and, as confirmed by the Spill record closure, consistent with NYSDEC requirements.

Potential Impacts to Human Health
A qualitative exposure assessment, as described in DER-10, Technical Guidance for Site Investigation and Remediation (NYSDEC, May 2010) considers five potential exposure routes: direct contact with surface soils (including incidental ingestion); direct contact with subsurface soils (including incidental ingestion); ingestion of groundwater; dermal (i.e., skin) contact with groundwater / inhalation of volatile groundwater constituents; and, inhalation of vapors (exposures related to soil vapor intrusion).

The first four exposure routes mainly relate to construction workers or environmental professionals and would be addressed through a Health & Safety Plan (HASP) as required by the Occupational Safety & Health Administration (OSHA).

The two exposure routes potentially affecting future building occupants and workers, absent engineering controls, are direct contact with surface soils and inhalation of vapors. Regarding direct contact, while petroleum-related compounds are not present at elevated levels in soil, two metals (arsenic and lead) are present at elevated levels. Inhalation of vapors is also possible given the concentrations of petroleum-related compounds in groundwater at the Site.

Recommendations
Within New York State, many properties with actual or perceived contamination have been developed for residential use, with the development including implementation of engineering and/or institutional controls (such as those identified in the WCDOH May 7, 2014 letter), to ameliorate potential impacts.

Based on our review of the data and experience on similar developments, and in order to be conservative with regard to potential impacts to future occupants of the 150 North Street Site, Tenen recommends that the following remedial design considerations be incorporated into any future development at the Site:

- Design and installation of a soil vapor intrusion mitigation system beneath occupied spaces in accordance with the New York State Department of Health (NYSDOH) *Final Guidance for Evaluating Soil Vapor Intrusion in New York State* (October 2006, or the most current version) and typical industry standards.
- Design and installation of a remedial cap in accordance with the New York State Department of Environmental Conservation (NYSDEC) *CP-51 Soil Cleanup Guidance* (October 21, 2010, or the most current version) and typical industry standards.

The above-referenced guidance documents consider different use categories and are not specific to the proposed development. The guidance documents also consider different types of building construction techniques (slab on-grade, basements, crawl spaces, etc.), which will allow for flexibility should an alternate design be proposed.

A soil vapor intrusions mitigation system vents the air beneath a building slab so that chemicals volatilizing from below do not concentrate below an occupied space; it also includes a vapor barrier or waterproofing to mitigate soil vapor or groundwater from entering the building.

A remedial cap consists of the building slab, paved areas and soil that is placed over areas with contaminant concentration that are inconsistent with the proposed use. The soil portion of the cap is tested prior to import to the Site to confirm that the appropriate SCOs are met. The NYSDEC guidance indicates that a two-foot cap is appropriate for residential and restricted-residential uses.

For the specific proposed development, the proposed engineering controls include capping the Site with a building slab, asphalt paving and imported soil; design of an open-air parking area on the majority of the first floor; and, installation of depressurization system or waterproofing (depending on the slab elevation as compared to groundwater) in the area of the first floor without parking. These remedial design considerations are generally consistent with the above guidance documents and documentation to that effect should be provided by the Applicant. Absent any additional soil testing, which may show a delineation of soil impacts, the cap should extend across the entire Site. Please note that any capping and filling should be consistent with State and local wetland regulations.

In prior meetings of the Rye City Council, the current building design has been discussed and the placement of future occupants on the second floor has been considered. In particular, if the occupants are not safe on the first floor, how can it be known they will be safe on the second floor? However, the occupants are not on the second floor to move them further from potential sources of environmental impacts but due to a design consideration where the parking acts as a venting system. Implementation of the NYSDOH guidance will incorporate venting below occupied spaces and this could be achieved with occupants present on the first floor.